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10/684,127	10/14/2003	Takahisa Kurahashi	204552030400	1271

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EXAMINER
TRINH, MICHAEL MANH

ART UNIT	PAPER NUMBER
2822	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/684,127	Applicant(s) KURAHASHI ET AL.	
	Examiner Michael Trinh	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on 27 June 2005.
2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,3,4,7,8,10 and 11 is/are pending in the application.
  4a) Of the above claim(s) 10 and 11 is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) 1,3,4,7 and 8 is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

*** This office action is in response to Applicant's Amendment filed on June 27, 2005. Claims 2,5,6,9 were canceled. Claims 1,3,4,7,8,10-11 are current pending, in which claims 10-11 are non-elected, without traverse.

*** The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

1. Claims 1,3 are rejected under 35 U.S.C. 102(b) as being anticipated by Jou et al (5,869,849).

Jou et al teach a method for manufacturing a semiconductor light emitting device comprising: forming a p-type contact layer 520 on an an-type first semiconductor substrate 500 (col 3, lines 48-67; col 4, lines 15-35; col 5, lines 20-29; and 120/320 Figs 1,3 at col 2, lines 35-53), wherein the p-type contact layer 520 has a thickness of 500 Angstroms at least (col 4, lines 53-58) is composed of a single layer whose composition is different from that of the first semiconductor substrate 500, wherein the p-type semiconductor layer 520 having a thickness of 500 Angstroms at least is within 3 micron or less; laminating a light emitting layer 532 (Fig 5a, col 3, lines 48-55; Fig 6a; col 4, lines 15-25) on an n-type first semiconductor substrate 500 the light emitting layer 532 being composed of a single semiconductor layer; laminating an n-type semiconductor layer 533 on the light emitting layer 532, the n-type semiconductor layer being composed of a single layer; forming a second semiconductor substrate 540 on an surface of the n-type semiconductor layer 533, the second semiconductor substrate 540 being transparent to a wavelength of emitted light from the light emitting layer (Fig 5b, col 3, line 54-67; Fig 6b; col 4, lines 19-35), then removing the first semiconductor substrate 500 (Fig 5c,6c); and forming a translucent electrode layer 570 (Fig 6d,6e; col 4, lines 27-35; col 6, lines 29-31; col 5, lines 1-28) on a surface of the p-type contact layer 520 exposed by removing of the first semiconductor substrate 500, the translucent electrode layer 570 being transparent to the wavelength of emitted light from the light emitting layer 532, wherein the thin thickness of 500 Angstroms at least of the p-type contact layer inherently prevents a decrease in luminance of the semiconductor light emitting device by restraining diffusion of p-type dopants into the light emitting layer during high temperature treatment. Re claim 3, wherein the second semiconductor substrate 540 is formed through direct bonding (col 3, lines 50-55; col 4, lines 15-25, lines 36-45; Figs 5b,6b).

Claim Rejections - 35 USC § 103

2. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jou et al (5,869,849) taken with Takanao (JP-2000-196139).

Jou et al teach a method for manufacturing a semiconductor light emitting device as applied to claims 1,3 above, in which, re claim 3, the second semiconductor substrate 540 is formed through direct bonding (col 3, lines 50-55; col 4, lines 15-25, lines 36-45; Figs 5b,6b).

Jou et al teach forming the second semiconductor substrate by direct bonding (as in claim 3), but lack forming by epitaxially growing (claim 4).

However, Takanao teaches (at English computer translation page 1, last 17 lines, in and forming a second semiconductor by epitaxially growing or direct bonding (translation page 6, paragraphs 0018-0021).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the second semiconductor substrate of Jou by alternatively employing either epitaxially growing or direct bonding processes as taught by Takanao, because these techniques are alternative for substitution in forming the second semiconductor substrate, wherein processes of epitaxial growth is simplifier than bonding so that forming the device is more efficient.

3. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jou et al (5,869,849) taken with Takanao (JP-2000-196139).

Jou et al teach a method for manufacturing a semiconductor light emitting device as applied to claims 1,3, above. Re further claim 7, forming a p-type semiconductor layer 520,531 on the first semiconductor substrate 500 (Fig 5a, col 3, line 48-67; Fig 6a; col 4, lines 5-35;53-58), wherein the p-type semiconductor transparent layer 520 is composed of a single layer whose composition is also different from that of the first semiconductor substrate 500, and wherein the p-type semiconductor layer comprises AlGaAs, InGaP, etc, (col 4, lines 53-58) with carrier concentration of greater than 1×10^{18} cm^{-3} (re claims 7-8). Re claim 7, Jou thus already teaches forming the p-type semiconductor layer including AlGaAs with a carrier density of greater than 1×10^{18} cm^{-3}.

Re claim 7, Jou et al thus lack mentioning the semiconductor layer obtained from an $Al_xGa_{1-x}As$ layer (where $0.5 \le x \le 0.7$); and Re claim 8, lack mentioning the semiconductor layer obtained from an $(Al_yGa_{1-y})_zIn_{1-z}P$ layer (where $0 \le y \le 1$, $0 \le x \le 1$).

However, Takanao teaches at (translation page 6, line 1 through paragraph 0031) forming the p-type semiconductor layer on the n-type or non-doped first semiconductor substrate 10, wherein the p-type semiconductor layer is an $Al_{0.68}Ga_{0.32}As$ layer 7 obtained form an $Al_xGa_{1-x}As$ layer (where $0.6 \le x \le 0.9$) (re claim 7, translation paragraphs 0022-0025,0030); and wherein the p-type semiconductor layer is alternatively obtained from an $(Al_yGa_{1-y})_zIn_{1-z}P$ layer (where $0 \le y \le 1$, $0 \le x \le 1$) (re claim 8, translation paragraph 0022-0025).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the p-type semiconductor layer of Jou by forming the p-type semiconductor layer by employing $Al_{0.68}Ga_{0.32}As$ p-type semiconductor layer obtained from the $Al_xGa_{1-x}As$ layer (where $0.6 \le x \le 0.9$) or employing a p-type semiconductor layer obtained from the $(Al_yGa_{1-y})_zIn_{1-z}P$ layer (where $0 \le y \le 1$, $0 \le x \le 1$), as taught by Takanao. This is because of the desirability to form a transparent current diffusion layer to the luminescence wavelength of light so as to improve external outgoing radiation effectiveness of light, wherein by employing the semiconductor layer obtained from the $(Al_yGa_{1-y})_zIn_{1-z}P$ layer (where $0 \le y \le 1$, $0 \le x \le 1$), moisture resistance is improved as there are fewer aluminum contents. Furthermore, the subject matter as a whole would have been obvious to one or ordinary skill in the art at the time the invention was made to select the portion of the prior art's range of concentration, thickness, x/y/z values, which is within the range of applicant's claims, because it has been held to be obvious to select a value in a known range by optimization for the best results, see In re Aller, etal., 105 USPQ 233, and would be an unpatentable modification, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In Re Aller* 104 USPQ 233,255 (CCPA 1955); *In re Waite* 77 USPQ 586 (CCPA 1948).

Response to Amendment

4. Applicant's remarks filed June 27, 2005 have been fully considered but they are not persuasive.

Applicant remarked (at remark page 5) that "Claim 1 recites that the p-type contact layer has a thickness of 3 µm or less and is set to prevent a decrease in luminance of the semiconductor light emitting..."

In response, this is noted and found unconvincing. In Jou, the

Re claim 9, wherein the p-type semiconductor layer 520 is set to have a thickness of 500 Angstroms at least, which thickness of 500 Angstroms at least which is within the claimed range of thickness of 3 micron or less. Thus, by forming the p-type contact layer 520 has a thickness of 500 Angstroms at least (col 4, lines 53-58), the p-type contact layer 520 inherently prevents a decrease in luminance of the semiconductor light emitting device by restraining diffusion of p-type dopants into the light emitting layer during high temperature treatment.

****

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

*** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272- 1847. The examiner can normally be reached on M-F: 8:30 Am to 5:00 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number is (571) 273-8300

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.
Oacs-15

Michael Trinh
Primary Examiner